

ART 34 AMDT

01-03-2004

10/508834
JT12 Rec'd PCT/PTO 23 SEP 2004
FR0300987

- 15 -

CLAIMS

1. A device for measuring the X-ray emission produced by an object (11) exposed to an electron beam,
5 characterized in that it comprises at least:
 - a subassembly (13) comprising electron emission means and an acceleration stage in which the electrons are subjected to a potential difference ΔV_1 ;
 - a space with no electric field (15, 110, 114)
10 in which the electron beam is shaped and controlled by suitable means (18, 19, 11, 116, 119);
 - a deceleration phase in which the electrons are subjected to a potential difference ΔV_2 of the same sign as ΔV_1 ;
 - 15 - a support (12) for positioning the object (11) beneath the electron beam; and
 - spectral analysis means (1113) for analyzing the X-rays emitted by the object being analyzed.
- 20 2. The device as claimed in claim 1, characterized in that the potential differences ΔV_1 and ΔV_2 are applied using two generators (14 and 119), the reference potentials of which are connected together, the first generator (14) raising the electron emission source to
25 the potential HV_1 and the second generator (119) raising the object to be analyzed (11) to the potential HV_2 .
- 30 3. The device as claimed in claim 2, characterized in that the reference potentials (1111) of the two generators (14 and 119) are connected to the ground of the device.
- 35 4. The device as claimed in either of claims 2 and 3, characterized in that the space with no electric field (15, 110, 114) comprises enclosures (16, 1111 and 1115) that are raised to the reference potential (1111) of

AMENDED SHEET

the two generators (14 and 119).

5. The device as claimed in any one of the preceding claims, characterized in that it includes an electrode
5 (118) placed between the specimen support and the rest of the device, this electrode being able to be raised to any potential.

6. The device as claimed in claim 5, characterized in
10 that this electrode (118) is a perforated plate, which can be cooled.

7. The device as claimed in any one of the preceding claims, characterized in that the space with no
15 electric field (15, 110, 114) contains means (113) for measuring the intensity of the beam current.

8. The device as claimed in claim 7, characterized in that the means (113) for measuring the intensity of the
20 beam current are associated with electron beam deflection means (112), these deflection means allowing the beam to be directed onto the means for measuring the electron current.

9. The device as claimed in claim 8, characterized in
25 that the deflection means (112) are activated by a rapid electronic system, allowing the measurement to be performed by sampling, during analysis.

30 10. The device as claimed in any one of the preceding claims, characterized in that the spectral analysis means (1113) comprise at least one WDS spectrometer.

11. The device as claimed in any one of the preceding
35 claims, characterized in that it includes an object chamber (1112) placed in a high-dry vacuum.

ART 34 ANDT

01-03-2004

FR0300987

- 17 -

12. The device as claimed in claim 11, characterized in that the object chamber (1112) includes a microleak.

5 13. The device as claimed in any one of the preceding claims, characterized in that it includes optical means for displaying the object analyzed.

10 14. The device as claimed in claim 12, characterized in that the optical means include at least one catadioptric optic (1114) placed near the object, a pierced deflection mirror (1115) and an external optical system (1116).

15 15. The device as claimed in any one of the preceding claims, characterized in that it includes an electronic command and acquisition interface (41) connected to the various elements of the device, allowing remote control of the device and acquisition of the data corresponding to the measurements carried out.

20 16. The device as claimed in claim 15, characterized in that it includes a computer (42) connected to the electronic interface (41) and equipped with a man-machine interface for remotely controlling the various elements of the device and for automatically exploiting the measurements made.

AMENDED SHEET